APPENDIX B

AN ANALYSIS OF THE PROBABILITY OF DEFAULT IN THE STAFFORD LOAN PROGRAM

The analyses of loan defaults presented here and in Chapter III are based on data from the 1987 Student Loan Recipient Survey of the National Postsecondary Student Aid Study (NPSAS). The population from which the NPSAS sample was drawn was the approximately 8 million people who borrowed through the Stafford or Federally Insured Student Loan programs and who left postsecondary schools between 1976 and 1985. A total of 8,223 borrowers were included in the sample.

THE SAMPLE DESIGN

The survey design is a stratified random sample. Schools were selected first and then borrowers at these schools were sampled. The chance of borrowers being selected varied with the number of years they had been out of postsecondary school and with their payment status. The three payment statuses are in default, in repayment, and fully repaid. Disproportionately large samples of borrowers who were in default or who had repaid their loans were chosen to assure sufficiently large samples for these groups to be analyzed separately. About 22 percent of the borrowers in the sample were in default and 20 percent had completely repaid their loans. In the population these fractions were each about 13 percent.

Borrowers who reported neither their income nor the amount that they borrowed were excluded from the analysis because they provided no information on two variables generally found to be of critical importance. In addition, borrowers who were in grace periods (during which time they do not repay their loans) were excluded from the analysis because they could not default while in a grace period. In addition, only individuals who reported their race as black or white were included because too few individuals of other races were sampled. After these exclusions, 6,359 borrowers were in the sample used for the analysis.

THE STATISTICAL TECHNIQUE AND RESULTS

A logistic probability (logit) model was used to estimate the effect that specific attributes have on the likelihood of defaulting on Stafford or FISL loans. In the logit model, the estimated likelihood of default always lies between zero and one. The estimate of the effect of one attribute on the chance of default depends on the values of the other characteristics--the estimate of a particular characteristic's effect is calculated at a specific value of each other characteristic. Here, the values of the other attributes are set at their average values in the sample. The chi-square value for goodness of fit is well above the .01 level critical value.

The likelihood that borrowers will default depends on their ability to repay and on their willingness to do so. Their ability to repay depends on factors such as their current and future income and assets, the variability of their income, their parents' financial resources and willingness to help repay the loans, the borrowers' expenses (particularly unexpected expenses), and the amount they borrow. Their willingness to repay a federally guaranteed Stafford Loan depends on factors such as their knowledge that loans should be repaid, their satisfaction with the education they received, their personal integrity, their concern about the financial consequences of defaulting, and their attitudes about both the government and banks.

The incomes reported are those in the year previous to the survey and so are not necessarily the ones most relevant to gauging the ability to repay the loans. The results do not change greatly if the individuals who had repaid their loans by the time of the survey are excluded from the analysis.

While data on income are available from the NPSAS survey, information on assets is not. To the degree to which assets and incomes are correlated, the estimated effect of income on the likelihood of default will also include the effect of assets. Because the correlation between assets and income differs for blacks and whites, these relationships were estimated separately for the two groups. Doing so will not capture any differences in asset levels between blacks and whites, however. Those disparities will be captured by the variable indicating the race of the borrower.

As expected, after taking into account the impact of other characteristics, whites with higher incomes are estimated to be less likely to default than are whites with lower incomes, although the effect is quite small (see Table B-1). There is no statistically significant relationship between the level of income and the likelihood of default for blacks. The 5 percent of the sample who have not held a job since leaving school were no more likely to default than others with their characteristics.

TABLE B-1. ESTIMATED EFFECTS OF ATTRIBUTES ON THE LIKELIHOOD OF DEFAULTING ON STAFFORD LOANS (In percentage points) [a]

Attribute	Average Value [b]	Change in Probability of Default [c]	Significance [d]
Race: White			
Income at time of survey[e]	28.8	-0	***
Income squared[e]	831	0	***
Race: Black			
Income at time of survey[e]	16.8	0	
Income squared[e]	283	-0	
Has Not Worked Since Leaving Postsecondary School	0.05	-0	
Range of Parental Income When Borrower Started Postsecondary School			
$0 - $10,999	0.06	5	
$11,000 - $16,999	0.03	7	
$17,000 - $22,999	0.04	2	
$23,000 - $29,999	0.05	-2	***
$30,000 - $49,999	0.17	1	**
$50,000 and over	0.28	1	**
Missing or don't know	0.37	-6	***
Parents Are Willing to Help Repay the Loan	0.10	-5	***
Others Are Willing to Help Repay the Loan	0.04	2	
Received a Grant in Postsecondary School	0.30	2	*

(Continued)

TABLE B-1. (Continued)

Attribute	Average Value [b]	Change in Probability of Default [c]	Significance [d]
Father's Educational Attainment			
No high school diploma	0.17	1	
High school diploma	0.30	1	
Vocational	0.08	-4	***
Some college	0.11	-2	**
College degree	0.16	0	
Postsecondary degree	0.12	-1	
Missing or don't know	0.05	5	
Mother's Educational Attainment			
No high school diploma	0.13	-1	
High school diploma	0.43	1	
Vocational	0.09	-3	
Some college	0.15	-2	
College degree	0.12	4	**
Postsecondary degree	0.06	4	*
Missing or don't know	0.03	-3	
Borrower Worked While in Postsecondary School	0.53	1	
Parents Helped Pay for Postsecondary School	0.41	-1	
Loan Amount[e]	7.0	0	
Spouse's Loan Amount[e]	0.8	-0	
Received a Deferment	0.23	4	***
No High School or GED Diploma	0.06	13	***

(Continued)

TABLE B1. (Continued)

Attribute	Average Value [b]	Change in Probability of Default [c]	Significance [d]
Type of School Borrower Attended [f]			
Private	0.38	1	
Proprietary	0.19	3	**
Public	0.68	2	
Age Borrower Left School and Highest Level of Postsecondary Education Completed [g]			
Younger than 22, no degree	0.07	7	
22 or 23, no degree	0.04	8	
24 to 27, no degree	0.04	18	***
Older than 27, no degree	0.05	23	***
Younger than 22, non-college degree	0.09	-4	***
22 or 23, non-college degree	0.04	1	**
24 to 27, non-college degree	0.07	4	
Older than 27, non-college degree	0.08	13	**
Younger than 24, college degree	0.19	-6	***
24 to 27, college degree	0.10	-2	***
Older than 27, college degree	0.08	4	
Younger than 28, graduate degree	0.08	-8	***
Older than 27, graduate degree	0.09	-2	***
Received Information About Loans	0.83	-9	***
Have Children	0.19	-0	
Married	0.52	-0	
Single Parent	0.05	5	**
Male	0.49	2	**
Black	0.12	17	***
Hispanic	0.02	11	***

(Continued)

TABLE B1. (Continued)

Attribute	Average Value [b]	Change in Probability of Default [c]	Significance [d]
Years Out of School	4.3	3	***
Years Out of School Squared	27	-0	***
Loan Amount Is Fully Imputed	0.05	-7	***
Missing Information on High School Completion	0.01	-3	
Constant	1		***

SOURCE: Congressional Budget Office estimates based on data from the National Postsecondary Student Aid Study.

NOTES: The total effect of several attributes is not equal to the sum of the individual effects because of nonlinearities in the model used to estimate the effects.

a. The overall likelihood of loan default is 13 percent.

b. The average value of a variable for categorical variables (those that can take on only a limited number of specific values) shows the percentage of the sample that has the given characteristic.

c. The change in the probability of default is the derivative for continuous variables and the estimated change in probability for categorical variables. For those categorical variables with only two possible values, this change is the probability of having the attribute minus the probability of not having the attribute. These estimates are computed at the average values of the other variables. The estimates are rounded to the nearest percent, so any values within 0.5 percent of 0 are recorded as a plus or minus zero.

d. *** significant at the .01 level
** significant at the .05 level
* significant at the .10 level

e. All income and loan values are expressed in thousands of 1990 dollars.

f. Borrowers may have attended more than one type of school.

g. Non-college degrees include two-year associate degrees and degrees from proprietary schools.

Access to other financial resources, which may be particularly important when unexpected difficulties arise, is also associated with a lower probability of default, all else being equal. Borrowers whose parents had higher incomes at the times they began their postsecondary educations are generally less likely to default than those whose parents had lower incomes.[1] Those who anticipated receiving or had received financial help from their parents in repaying their loans are likewise somewhat less likely to default. Perhaps surprisingly, however, receiving this type of help from others is not associated with a decline in the likelihood of default. Borrowers who received grants (given a particular level of income, those with fewer assets were more likely to qualify for grants) are likewise slightly more likely to default than are other borrowers. No consistent relationship is found between parents' educational attainment and the borrower's chance of defaulting.

The total amount of borrowing does not affect the estimated likelihood of default in this model.[2] This result may occur because the amount of borrowing was related to other traits included in this model, such as the highest degree obtained.

Recipients who received deferments on their loan repayments are slightly more likely to default than are those who did not receive them, all else being equal. This result could indicate that some deferment periods are too short or do not cover all periods of financial hardship for borrowers, such as the unemployment of a spouse. Alternatively, perhaps the greater passage of time for borrowers receiving deferments reduces their commitment to repaying their loans.

The chance that borrowers default is much higher for those without either a high school diploma or a General Education Development (GED) degree than for those with one of them, holding further educational attainment and other factors constant. This result may indicate that students with little academic success in high school benefit less from any future education than do those who successfully complete high school, or that they have more erratic earnings and are thus more prone to default.

The types of schools that borrowers attended--many attended more than one type--and the degrees that they received also are related to whether or not they default, again after accounting for the influences of other traits.

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1. It may also be that borrowers from higher-income families have a greater knowledge about and experience with credit, leading them to have a greater willingness to repay their loans.

2. This result was somewhat sensitive to the exact specifications of the model in this analysis, however.

Recipients who attended proprietary schools are more likely to default than those who did not, while the chance of default is unaffected by whether or not borrowers attended public or private colleges.[3] The types of schools attended by borrowers may also affect their willingness to repay student loans. For example, if borrowers attending proprietary schools are systematically less satisfied with their educations, they may be more likely to default.

Borrowers who completed more postsecondary education are less likely to default than are those who completed less education, presumably at least partly because of increased earnings many years into the future. In addition, those who were younger when they left school, given their educational attainment, are less likely to default, perhaps indicating that these individuals have greater abilities or motivation that translate into higher future earnings.

The chance of default is also affected by the willingness of borrowers to repay their loans, although little information about their willingness to repay is contained in the available data. Notably, borrowers who received information about repaying their loans from their postsecondary institutions or their banks are much less likely to default than are those who received no information.[4] This result highlights the importance of borrowers understanding they are obliged to repay their loans.

Other attributes are included as controls because they may be correlated with important traits that are not available in the data. Whether or not borrowers have children or are married; their sex, race, and ethnicity; the number of years they have been out of school; if the loan amounts were fully imputed; and if information on high school degrees was unavailable are all included to control for missing information.

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3. The data used here were collected before the rapid growth in the number of proprietary schools. If more current data were available, the effect of attending a proprietary school on the chance of default might be greater.

4. All borrowers now receive information from lenders when they receive their loans and again before their repayment periods begin. This includes information on when the repayment begins, the length of repayment, and the consequences of default.